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ABSTRACT

This report of a conference dedicated to the growth of professionalism within the field of learning assistance begins with a brief introduction reviewing the origins and objectives of the sponsoring association, followed by 10 representative papers. The papers have the following titles and authors: "The Classroom Research Project: Results at the Three-Quarters Mark" (K. Patricia Cross, Thomas A. Angelo); "Understanding Personality: A Tool for More Effective Learning and Teaching" (Maureen Kelly, Sally Daniels); "Learning Assistance for Medical Students" (Wilton A. Barham and others); "Tutors and Tutees: Learning Together" (Julia Beyeler, Ruth Dean); "Managing Student Learning: The Teacher as Curricular Expert" (Jay Einhorn); "The Key to Success: A Nontraditional Reading Program" (Jean-Louise Gustafson, Christine Poziemski); "Tutor Training: Tutor Training Workshop" (Muriel Harris, Sharon Silverman); "Test Anxiety: What It Does and What Can Be Done" (Marjorie Roth Leon, Rita M. Weinberg); "Tests That Teach" (Michael Meyer); and "Education: A Vision for the Future" (Scott A. Levin). Many papers include references. (DB)

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Midwest College Learning Center Association

"Pathways to Excellence in Teaching and Learning"

Fourth Annual Conference
October 11-13, 1989
Orrington Hotel
Evanston, Illinois

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"Unless teachers can make connections between their teaching and what students already know, learning is not likely to follow."

-Keynote Speaker,
K. Patrica cross
University of California, Berkeley

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PROCEEDINGS FROM THE FOURTH ANNUAL MCLCA CONFERENCE

A collection of presentations and papers representative of those delivered in Evanston at the October, 1989, conference.

Edited by

Carol A. Eckermann,
1989 Conference Chair
National-Louis University

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INTRODUCTION

The Midwest College Learning Center Association (MCLCA) was formed in 1986 as a regional organization dedicated to promoting excellence among learning center personnel in twelve midwestern states. According to its constitution, the association was organized exclusively for educational purposes, and the following eight objectives were identified.

1. To promote professional standards for learning centers through education, curriculum design, research and evaluation.

2 To promote support for learning centers by acting on issues effecting learning assistance programs.

3. To assist in the development of new learning centers.

4. To assist in the professional development of personnel in learning assistance programs by providing opportunities for sharing professional methods, techniques, and strategies.

5. To provide an annual conference for the exchange of ideas, methods and expertise in learning assistance programs.

6. To publish educational information and research in the field.

7. To develop and expand a communications network among learning assistance professionals.

8. To coordinate our efforts with similar professional groups.

MCLCA continuously strives to meet these objectives and has been particularly successful at sponsoring a conference each year since 1986. With the compilation of these proceedings from the 1989 conference, the organization hopes to contribute further to the growth of professionalism within the field of learning assistance.

THE CLASSROOM RESEARCH PROJECT: RESULTS AT THE THREE-QUARTERS MARK

K.Patricia Cross
Thomas A. Angelo
University of California, Berkeley

INTRODUCTION

On November 15, 1989, at the end of twenty-two and one-half very productive months, the Classroom Research Project* reached the three-quarters mark in its organizational life span. Just over a year ago, on November 1, 1988, we issued our first progress reports. An abstract of the report appeared in the April/May 1989 issues of the AACJC Journal. Now, as we enter our final phase, it once again seems an appropriate moment to take stock and offer an update.

This second progress report provides an overview of the Project's accomplishments during the first three-quarters of its thirty-month running time and outlines our plans for the remaining quarter. It reports on the status of the Project's efforts to develop the tools and techniques faculty need to become Classroom Researchers, to design and field-test methods for training faculty and faculty developers in Classroom Research, and to disseminate related information and instructional materials. At the same time, this report identifies the products the Classroom Research Project will complete and activities it will carry out during the coming year.

Simply defined, Classroom Research is a straightforward, learner-centered, teacher-directed approach to improving the quality of learning in higher education where it matters most -- in thousands of college classrooms across the nation. The primary purpose of Classroom Research is to help college faculty improve the effectiveness of their teaching by getting feedback from students on what they are learning.

To bring about this improvement in teaching effectiveness, the Classroom Research Project encourages and trains faculty to become "Classroom Researchers," teachers skilled at identifying and clarifying their instructional goals and assessing how well they are meeting them. As faculty members practice Classroom Research, they come to understand more fully how their students learn -- and

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*The Classroom Research Project is jointly funded by the Ford Foundation and the Pew Charitable Trusts.

sometimes fail to learn-- the skills, knowledge and values critical to their disciplines. They become more reflective, self-aware professionals, more adept at accurately diagnosing learning problems and at effectively responding to them. Participating faculty also increase their capacity to help students become more effective, self-directed learners. In other words, Classroom Research empowers both teachers and students.

Nationwide, the Classroom Research Project has found a receptive audience for its message, as ever-larger numbers of faculty from two- and four-year colleges, public and private, have requested information, instructional materials, and training in this approach. In the last six months alone, for example, the Project has provided training workshops in Classroom Research for more than 650 faculty and faculty developers at sixteen different sites.

During the past two years, Professor Cross and Dr. Angelo have given invited talks on Classroom Research to approximately three thousand teachers and administrators on campuses and at conferences from Massachusetts to Hawaii, Washington state to Florida, and Wisconsin to Taxas. In addition, as a third rough indicator of interest in Classroom Research, the National Center for Research to Improve Postsecondary Teaching and Learning (NCRIPTAL) reports having sold nearly 5,000 copies of Cross and Angelo's Classroom Assessment Techniques: A Handbook for Faculty since its publication in April 1988.

Since 1988, the Classroom Research Project has provided extensive on-site faculty training and consultation for a dozen campuses and two large consortia. Nonetheless, many more colleges have requested direct assistance than the Project could accommodate, and requests continue to come in. Demand for site visits and in-service training for faculty has far outstripped our capacity to respond. To meet this demand, the Classroom Research Project has developed written materials and training methods that can be "exported" to interested colleges, where they can be training methods that implemented by on-campus faculty development specialists without assistance from outside consultants. The Project has also increasingly focused its efforts on preparing faculty developers to carry out their own faculty training workshops.

AN OVERVIEW OF PROJECT ACTIVITIES

Research on Faculty Teaching Goals

Since effective assessment requires clear goals, one of the Classroom Research Project's most important tasks is to develop ways to help faculty clarify their instructional goals. After finding very little research on the course-specific teaching goals of college teachers in the relevant literature, we designed a

survey instrument, the "Teaching Goals Inventory," to help us better understand this critical starting point.

The "Teaching Goals Inventory" (TGI) was pilot-tested at Bradford College and Miami-Dade Community College in the spring of 1987. (Dr. Elizabeth Fideler was instrumental in developing and pilot-testing the first version of the inventory.) One year later, after revising instrument in response to the pilot test, we administered the TGI to a selected sample of 22 colleges nationwide: 6 public two-year colleges, 3 public four-year colleges, and 13 private four-year colleges. All in all, more than 1850 college teachers took part in the spring 1988 administration--about 750 from two-year colleges and over 1,100 from four-year colleges.

Descriptive analyses of the results showed that faculty goals differed not only by institution type (two- vs four-year), but also by faculty age, gender and, most strikingly, by discipline. Cluster analysis of faculty responses resulted in an empirically derived clustering of goals. These goals clusters form the basis of a self-scoreable version of the TGI which we use in training workshops to help participating teachers make their goals and priorities explicit.

In the summer of 1989, the Project began the process of revising the "Teaching Goals Inventory" once again. Eighty-five faculty development experts were asked to create their own ideal goal-clusters for the TGI, to indicate goals that should be deleted from the Inventory, and to suggest new goals for inclusion in the final version. Fifty-five(55%) of the expert sample responded, and their responses are now being analyzed. Revisions to the Inventory will be based on results of this expert Q-sort task, on experience gained from repeated use of the workshop version of the TGI, and on results of the large-scale 1988 faculty survey. By the end of 1989, the Project will have completed final drafts of the new survey and workshop versions of the Teaching Goals Inventory.

In the spring of 1990, the Classroom Research Project will undertake its third and final administration of the "Teaching Goals Inventory" with larger and more diverse samples of two- and four-year college faculties. The aim of this third administration will be to improve the psychometric properties of the instrument and further explore the cluster structures.

Materials Development

Written Materials

In 1988, as a complement to the above-mentioned "Teaching Goals Inventory," the Classroom Research Project produced Classroom Assessment Techniques: A Handbook for Faculty, a book containing 30 classroom assessment techniques (CATs). Once faculty have

clarified their teaching goals with the TGI, they can find a number of easy-to-use, generic feedback techniques in the Handbook to help them assess how well they are achieving those goals.

Two more books are in progress, both of which are contracted to Jossey-Bass Publishers. The first is a follow-up to the NCRIPTAL Handbook. This second, expanded and much-revised handbook will contain discipline-specific classroom assessment techniques developed and field-tested by teams of college teachers with Project assistance. It will also feature a self-scoreable version of the TGI. The classroom assessment techniques (CATS) contained in the second handbook will be indexed to the goals in the Inventory and illustrated by brief examples of the use of CATs in various disciplines. The revised handbook is scheduled for completion in early 1990.

The third major writing project will be a comprehensive text on Classroom Research. Its main purpose will be to serve as a resource and guide for those interested in improving college and university teaching and learning in general, and in carrying out and implementing Classroom Research in particular. It is designed for use as a primary textbook in graduate-level courses on teaching and learning in higher education. We plan to complete this text by spring 1991.

Instructional Videotapes

During the spring of 1989, a trio of faculty and administrators from the College of Marin produced a short informational videotape on Classroom Research. During the summer, the Classroom Research Project collaborated with the College of Marin team in revising and editing this videotape, which has since been used in all introductory workshops and in many presentations on Classroom Research. Development of this videotape was financed entirely by the College of Marin, and copies were provided gratis to all California community college presidents. It is now being sold nationwide through the Product Development and Distribution Office of Miami-Dade Community College.

The College of Marin tape has proved particularly useful for generating interest in Classroom Research. As a result, the U.C. Berkeley Classroom Research Project plans to jointly develop two additional instructional videotapes with the Marin College production team in 1990. The first of the two Project-sponsored video tapes will complement the 14-minute Marin tape by offering a solid conceptual introduction to Classroom Research. The second planned video will illustrate the concept in some detail by showing how faculty in 3 to 4 different disciplines design and carry out simple Classroom Research Projects.

Instructional Development

The Project has developed three approaches to training college teachers who want to become Classroom Researchers. The first is an on-site, in-service workshop for faculty. It consists of 8-12 hours of instruction, practice, consultation and follow-up over the course of six to eight weeks. The second is a two-day intensive training seminar designed to prepare faculty developers and academic administrators to offer Classroom Research training on their own campuses. The third approach is an in-depth, graduate-level course in teaching, learning, and classroom research in higher education.

Workshops for Faculty

During the fall 1988 semester, the Classroom Research Project sponsored workshops for faculty groups at Los Medanos, Diablo Valley, and Marin Community Colleges in the Bay Area. In January 1989, the Project provided similar workshops for the faculti ; of St. Michael's College in Vermont and King's College in Pennsylvania, both private, liberal arts colleges.* With sponsorship from the institutions themselves, faculty training workshop have also been presented at the following colleges: Bethany College (Kansas), Glassboro State College (New Jersey), Joliet Junior College (Illinois), Macomb Community College (Michigan), Miami-Dade Community College (Florida), and the U.C. Berkeley Extension Faculty (California).

Classroom Research workshops for faculty have also been sponsored by consortia of community colleges in California, Texas, and Massachusetts, by the Wisconsin University Teaching Improvement Center, and by the Bush Foundation's Regional Consortium in the Midwest. Two national organizations, the American Association for Higher Education (AAHE) and the Council for Independent Colleges (CIC), have also sponsored training workshops for their members.**

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*In response to a Project survey at the end of Year I, 97% of the faculty who had participated in Project-sponsored workshops reported having used Classroom Assessment Techniques in their courses. On average, they reported having carried out 9 classroom assessments and having tried 3 new CAT's as a result of the workshop. Ninety-five percent planned to use CAT's again in the following semester.

Of 271 faculty participating in 8 recent workshops, 92% rated workshop **quality as "good" (45%) or "excellent" (47%), and 82% rated the workshops as "very" (52%) or "extremely" (30%) **useful**. (Response choices for **quality** were awful, poor, acceptable, good, or excellent; for **usefulness**,useless, not very, somewhat, very, or extremely.)

Workshops for Faculty Developers and Academic Administrators

To help colleges develop "in-house" capacity to provide faculty training, and to more efficiently disseminate the approach,the Project has developed a two-day training-for-trainers seminar for faculty developers and academic administrators. In the summers of 1988 and 1989, select groups of faculty development specialists from around the country participated in this seminar at Western Carolina State University.* These two seminars, known as Smoky Mountain I and II, were sponsored by NCRIPTAL (National Center to Improve Postsecondary Teaching and Learning) within the larger framework of the Center's materials and product dissemination activities.

In June 1989, the U.C. Berkeley Classroom Research Project joined with the University Extension to offer a two-and-a-half day workshop in Classroom Research for 50 instructional leaders from across the U.S.** A second training workshop for trainers will be offered in June of 1990 to 100 qualified applicants, and will be followed by a one-day national conference on Classroom Research.

Graduate-Level Courses

The third instructional model is a graduate-level, semester-long course focusing on improving college teaching and learning in general, and on Classroom Research in particular. This course was first offered at Harvard University's Graduate School of Education in spring 1988. It was revised and offered in spring 1989 as part of the Higher Education Doctoral Program in U.C. Berkeley's School of Education. After further revisions, it will be offered again at U.C. Berkeley this coming spring, and for the foreseeable future. The course, co-taught by Drs. Cross and Angelo, is designed to serve prospective faculty, faculty development specialists and academic administrators. Related future plans include the development of an intensive version of the course to be offered to in-service faculty during summer seminars and/or as a short-term faculty development course during the academic year.

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*Ninety-one percent of the Smoky II participants rated the workshop's **quality** as "good"(32%) or "excellent"(59%); 100% rated it "very"(41%) or "extremely"(59%) **useful**.

Ninety-four percent of the 1989 Berkeley workshop participants rated it as "very" (44%) or "extremely" (50%) **useful; 88% rated the **quality** as "good" (50%) or "excellent"(38%).

Dissemination

In addition to the Handbook, the workshops for faculty and faculty developers, and the graduate course, the Project has used speeches, conference presentations and published articles to inform the higher education community about Classroom Research.

Speeches and Conference Presentations

Since 1986, K. Patricia Cross has developed the concept of Classroom Research through a series of speeches to national organizations, including the Association of Faculty for the Advancement of Community College Teaching (AFACCT), the American Association for Higher Education (AAHE), the National Council for Staff, Program, and Organizational Development (NCSPOD), the Professional Organizational Development Network (POD), and the American Association of Junior and Community Colleges(AACJC). Thomas Angelo has also made presentations to AAHE, POD, the Association for the Study of Higher Education (ASHE), the Bush Regional Consortium, and the California Association of Community Colleges (CACC) on the Classroom Research Project and the results of 1988 TGI study.

Journal Articles and Chapters

Dr. Cross has written articles on Classroom Research that have appeared in Change, the AAHE BULLETIN, the Phi Delta Kappan, and a number of other publications. Dr. Angleo has written on the subject for the faculty development journal To Improve the Academy and for a forthcoming volume on improving college teaching in the Jossey-Bass New Directions in Teaching and Learning series. As co-authors, Cross and Angelo have published an article on Classroom Research in the AACJC Journal and a chapter relating Classroom Research to teaching assistant training in a recent New Directions in Teaching and Learning volume.
[See Attachment 3 for references to articles, chapters and selected speeches.]

Executive Summary

The Classroom Research Project is dedicated to improving the quality of college learning by helping teachers improve the effectiveness of their own teaching. It works to improve teaching effectiveness by providing faculty with the tools, skills, and support needed to become Classroom Researchers: active assessors of student learning in their own classrooms.

Project activities develop, refine, and disseminate materials and models. Materials being developed include an instrument for clarifying teaching goals, handbooks of interdisciplinary and discipline-specific techniques for assessing classroom learning, a comprehensive guide and resource text for Classroom Researchers,

and instructional videotapes. The Project has also developed model syllabi and related materials for pre- and in-service training in Classroom Research. In addition, by working with national organizations and regional consortia, the Project is helping to create networks through which teachers doing Classroom Research can productively share ideas, findings, and lessons learned.

The Classroom Research Project is jointly funded by the Ford Foundation and the Pew Charitable Trusts under grants which began in January, 1988 and will end in June, 1990. Located within Harvard University's Graduate School of Education during its first eight months, the Classroom Research Project is now based in the University of California at Berkeley's Graduate School of Education.

This brief report begins by outlining the purpose and goals of the Classroom Research Project. Next, it describes the Project's past, present and future activities in the broad areas of research, materials development, instructional development, and dissemination. Throughout, it reports progress made in each of these areas during the Project's first three quarters. The three attachments that follow list the basic assumptions of Classroom Research, describe its major products in some detail, and provide references to published materials, texts of speeches, and a videotape on Classroom Research.

ATTACHMENT 1:

The Basic Assumptions of Classroom Research

The Classroom Research Project's model of Classroom Research is based on the following assumptions:

1. That the quality of student learning is directly--though not exclusively--related to the quality of classroom teaching. Therefore, one of the most direct and promising ways to improve learning is to improve teaching;

2. That, to improve their effectiveness, teachers need first to make their goals and objectives explicit and then to get specific, comprehensible feedback on the extent to which they are achieving those goals and objectives;

3. That to improve their learning, students need to receive appropriate and focused feedback early and often;

4. That the research most likely to improve teaching and learning is that conducted by teachers on questions they themselves have formulated in response to the problems or issues in their own teaching;

5. That inquiry and intellectual challenge are powerful sources of motivation, growth and renewal for college teachers, and that Classroom Research can provide such challenge; and,

6. That there is nothing so esoteric, mysterious, or fragile about Classroom Research that it cannot be entrusted to and done by anyone capable of and dedicated to college teaching.

ATTACHMENT 2:

A Summary Report on The Project's Main Products

Product 1: A Teaching Goals Inventory (TGI) - survey and workshop versions

Description: A simple questionnaire on which the teacher rates the importance of 48 teaching goals to a specific course he or she is teaching.

Purpose: To help teachers make their instructional goals more explicit and, consequently, more assessable.

Status: Two large-scale surveys have been carried out. Survey and workshop versions of the Inventory have been developed and field-tested. Further research was carried out to refine and finalize the instrument, making use of the expert judgements of faculty development specialists.

Next steps: Final revisions to the instrument; a third, large-scale administration of the final survey research version in spring 1990; and, further development of context-specific and self-scoreable forms of the workshop TGI.

Product 2: A handbook of Classroom Assessment Techniques for college teachers (Handbook I).

Description: A collection of simple, generic Classroom Assessment Techniques (CATs) supplemented by brief syntheses of relevant literature and an introduction to Classroom Research.

Purpose: To provide college teachers with simple techniques to get feedback from students on what they are learning in the classroom and through course assignments.

Status: Completed and published as Classroom Assessment Techniques: A Handbook for Faculty by K. Patricia Cross and Thomas A. Angelo. Published by NCRIPTAL (National Center for Research to Improve Postsecondary Teaching and Learning), 1988. [This book is available for $15 per copy, postage included, from NCRIPTAL, University of Michigan, Suite 2400, Ann Arbor, MI 48109-1259.]

Next steps: See Product 3 below.

Product 3: A revised and enlarged handbook of discipline-specific Classroom Assessment Techniques (Handbook II).

Description: A second-generation handbook of Classroom Assessment Techniques (CATs) developed for and field-tested by college faculty in specific disciplines such as Math, English, Social Sciences and Natural Sciences.

Purpose: To provide college teachers in a number of widely-taught disciplines with assessment techniques of proven application to their fields.

Status: In development. Five campus-based disciplinary "task forces," each made up of 8-30 college teachers, adapted and developed CATs to field-test in courses during the spring and fall of 1989. Reports on the adapted and new techniques have been analyzed and summarized.

Next steps: The text of the revised and expanded Handbook is presently being written. [This text should be available by late summer 1990 from Jossey-Bass Inc., Publishers, 350 Sansome Street, San Francisco, CA 94104-1310.]

Product 4: A Classroom Research textbook.

Description: This will be a comprehensive treatment of Classroom Research, containing syntheses of relevant literature from related fields such as learning theory, faculty development, teacher evaluation, and educational assessment. It will also contain examples of and guidelines for designing and carrying out Classroom Research projects, and for analyzing and applying the results of those projects.

Purpose: To serve as a comprehensive introduction, resource and guide for college teachers, faculty development specialists, and academic administrators who wish to practice and implement Classroom Research. It will be written to serve both as a textbook for graduate-level courses on teaching and learning in higher education and as a stand-alone guide for interested individuals.

Status: In development. An extensive and in-depth literature search has been completed, resulting in a research bibliography of more than 600 entries. Case studies of functioning Classroom Research

projects are now being written for inclusion in the text.

Next steps: Writing will begin this winter and a first-draft version of the text should be completed by spring 1991.

Product 5: Faculty workshops in Classroom Research.

Description: The basic workshop consists of six 90- to 120-minute sessions, for a total faculty time commitment of 9-12 hours. The first two sessions are devoted to introducing the concepts and training participants in the methods and techniques of Classroom Assessment. The second two sessions are designed to help participants design and carry out their own, limited-scale Classroom Research projects. Sessions five and six are focused on following-up and assessing the individual faculty projects.

Purpose: To train interested faculty on their home campuses in the fundamentals of Classroom Research; to help faculty members design Classroom Research projects to carry out in their own classes; and, to support such faculty projects through individual consultation and the formation of Classroom Research "task forces" composed of teachers with related interests and project.

Status: Development, field-testing and revision completed. The complete workshop has now been presented to teachers on more than a dozen different occasions, both on campuses and at conferences.

Next steps: A stand-alone version of the workshop that can be used by faculty developers on their own campuses is being completed. This workshop model consists of a detailed syllabus, guidelines for successful implementation, examples of successful faculty Classroom Research projects, and a complete set of instructional materials. This material will be disseminated through the in-service workshops for faculty developers and administrators (see Product 8).

Product 6: A graduate-level course in using Classroom Research to improve College teaching and learning

Description: This course offers a systematic and comprehensive introduction to college teaching and learning and to Classroom Research to graduate students, college

faculty, faculty development specialists and academic administrators. It develops the knowledge and skills needed to carry out Classroom Research, to train others to do Classroom Research, and to implement and support ongoing Classroom Research projects.

Purpose: To provide a model syllabus and reading list to instructors interested in offering in-depth Classroom Research preparation to graduate students, in-service and pre-service faculty, faculty developers and academic administrators.

Status: Basic syllabus completed and field-tested at Harvard Graduate School of Education, spring 1988. Revised syllabus field-tested spring 1989 at U.C. Berkeley Graduate School of Education in the Higher Education Doctoral Program.

Next steps: The graduate course will be revised and offered again at Berkeley this coming spring. A second, condensed version of the course may be developed for in-service faculty development use by colleges and systems, or as a summer institute. A final version of the course syllabus will follow the publication of the Classroom Research Textbook (see Product #4), sometime in 1991.

Product 7: Two informational/instructional videotapes.

Description: The first of these tapes will be 20 to 30 minutes in length. It will introduce the concept of Classroom Research through excerpts from speeches, workshops, and interviews featuring Professor Cross and Dr. Angelo. The second tape will be 30 to 40 minutes in length and will illustrate the concept of Classroom Research through 3 or 4 "case studies" of simple projects carried out by faculty in different disciplines. Both tapes will be of professional quality.

Purpose: To supplement the available written materials and the 1989 College of Marin videotape and to provide campus faculty developers with more varied resources to use in training faculty on site.

Status: Initial planning and rough script outlines for the two tapes have been completed.

Next steps: In early 1990, the production team will begin scripting the two videotapes, editing available footage and shooting the required new footage. The

two tapes will be completed by June 1990, in time for the summer workshop and conference (see Products 8 and 9).

Product 8: An in-service workshop for faculty developers and academic administrators in training faculty to carry out Classroom Research.

Description: This workshop consists of 12-14 hours of instruction and active participation over a two-day period. The first day is a run-through of the entire one-day faculty workshop. The second day focuses on preparing faculty developers and others to lead faculty training workshops on their own campuses. Enrollment is limited to 100. This workshop is entirely self-supporting. Administration and logistics are being handled by the U.C. Berkeley Extension staff.

Purpose: To develop local, on-campus capacity to train faculty in Classroom Research and, as a consequence, to disseminate the approach more widely, more efficiently and more economically.

Status: Development, field-testing and revision have been largely completed. This two-day training-for-trainers workshop has now been offered three times.

Next steps: The U.C. Berkeley Faculty Development Institute will offer this workshop again on June 13-15, 1990. Calls for participation have gone out and advertising has begun. Participants will be selected in March and notified soon after. [For more information on the summer workshop, contact Ms. Faye Bishop, U.C. Extension, 2223 Fulton Street, Berkeley, CA 94720, (415) 642-1171.]

Product 9: A one-day, national conference on Classroom Research.

Description: This conference, to be held on Saturday June 16, 1990 at U.C. Berkeley, will bring together Classroom Researchers from across the country. It will feature keynote speeches on research in the classroom by K. Patricia Cross and Wilbert J. McKeachie, as well as 15 to 20 presentations by individuals and panels. These presentations will focus on exemplary Classroom Research projects in specific disciplines and on successful campus and consortial programs. We are planning to host 40 to 50 presenters and 250 to 300 attendees.

Like the workshop that precedes it, the conference will be entirely self-supporting and is administered by the U.C. Berkeley Extension staff.

Purpose: To provide a national forum for Classroom Researchers during which they can share lessons learned from the past three years of experimentation. It will also serve as a capstone for the U.C. Berkeley Summer Workshop in Classroom Research, to be held on the two days immediately prior to the Conference, and for the Classroom Research Project itself.

Status: Planning has been completed and first-round mailings and advertisements are out. Responses to the call for proposals and the advertisements have already begun to come in. Detailed informational brochures will be mailed in January 1990.

Next steps: From January through March, 1990, we will select presenters and work with them to refine their proposed sessions. In April and May, the conference program will be scheduled.
[For information on the conference, contact Ms. Faye Bishop. U.C. Extension, 2223 Fulton Street, Berkeley, CA 94720, (415) 642-1171.]

ATTACHMENT 3:

REFERENCES

Published Materials: Books, Monographs, Chapters and Articles

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UNDERSTANDING PERSONALITY:
A TOOL FOR MORE EFFECTIVE LEARNING AND TEACHING

Maureen Kelly
Sally Daniels
National-Louis University

THE MYERS-BRIGGS TYPE INDICATOR AND TEACHING AND LEARNING STYLES

Summary:

Participants completed a short form Myers-Briggs personality questionnaire. The presenters used this data to discuss personality differences and how they affect learning and teaching styles.

Abstract:

Learning theory has greatly benefited from the advances in psychological understanding achieved in the twentieth century. Learning formerly was focused on the content to be communicated, almost despite the conveyor (teacher) and the receiver (student). Educational theorists are increasingly aware of personality differences impacting learning and teaching styles. Building on this awareness, the presenters have been using the Myers-Briggs Type Indicator (MBTI) in workshops with teachers, discussing their teaching styles in the light of their personality preferences. This instrument makes it possible to utilize the insights about individual differences described by Swiss psychologist, C. G. Jung, in this book, Psychological types (1953). Understanding one's own personality type and how it affects one's cognitive style becomes a doorway to accepting the importance of various teaching strategies to reach different students. This need is applicable whether in a classroom setting or one of individualized instruction.

Today the significance of personality differences in learning and teaching styles is widely acknowledged. Literature and diagnostic instruments in the field are expanding to match the interest. Discernment among the offerings is critical. Keen and Bronsema (1981) reviewed several approaches to cognitive style in terms of theory, reliability and validity, and chose the MBTI as an instrument to help integrate cognitive style research. A recent review of learning style theories, instruments, and practices identified the MBTI as one of the comprehensive learning style instruments (Keefe, 1987). Its reliability in generating information about cognitive styles promotes its use as the basis for designing teaching strategies.

The learning act includes a teacher, a student and content. These are all important components in educational strategizing, but

due to time constraints this workshop focused only on the teacher understanding her/his own personality and how it affects her cognitive style. Its ramifications for her/his learning can be generalized to include the type differences among her students. Understanding the importance of personality differences from one's own perspective provides the dedicated teacher with ample motivation to plan teaching strategies accounting for various learning styles. The MBTI is a trustworthy instrument for making practical application of one's theoretical conviction about learning styles.

The MBTI collects data about four mental functions and four attitudes a person uses to learn, make decisions and act in the world. The workshop presentation highlighted the four mental functions as they combine to describe four learning styles. Carl Jung postulated two sets of opposing functions, i.e., sensing or intuition, and thinking or feeling. Sensing or intuition are perceiving, information-gathering functions. Thinking or feeling are judging, decision-making functions. The pairing of perception and judgment preferences results in four different styles which can be summarized briefly by key behaviors:

Sensing-Thinker (ST) is a realistic, objective and practical learner;

Sensing-Feeler (SF) is a sociable, interpersonally oriented and empathic learner;

Intuitive-Thinking (NT) is a theoretical, intellectual and logical learner;

Intuitive-Feeling (NF) is an insightful, imaginative and people-oriented learner.

These pairings provide a pragmatic tool for assessing learning styles. These four learning styles can be translated into the four basic goals of education: mastery, understanding, synthesis and involvement. The ST learner is interested in mastery while the NT learner is focused on understanding; the SF learner is looking for involvement, and the NF learner is concerned with the synthesis.1 In addition to one's perceiving and judging preferences, an important dimension for learning involves one's orientation of introversion or extraversion. An introverted orientation determines a reflective learning approach, and an extraverted outlook produces an active approach to learning. This data is collected with the MBTI and must be considered, as well, in designing teaching strategies.

1 Harvey F. Silver & J. Robert Hanson, Teaching styles and strategies, p.5.

These concepts were delineated in a brief overhead presentation. They were then concretized through a hands-on exercise of developing a lesson plan, with specific instructions for accommodating the different learning styles. Participants were also guided in a process of looking at their own educational history to recall the teaching styles and learning experiences that helped them to learn. They were asked to reflect upon how these successful moments might have affected the evolution of their own teaching styles. This reflection brought the theory into clearer focus; each teacher personally prefers one of the four learning styles: ST, SF, NT, or NF. By viewing one's own experience within that framework, one is grounded to appreciate the importance of different modes of presentation and interaction with the material. In the time allotted to us, an interesting process was begun.

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LEARNING ASSISTANCE FOR MEDICAL STUDENTS

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INTRODUCTION

In focusing on this topic, we would like to use our knowledge and experience and that of our colleagues at the Health Sciences Center of the University of Illinois at Chicago to address the demands and types of learning assistance provided to medical students. The University of Illinois College of Medicine is the largest in the country and it offers a traditional format for medical education that is found at many other medical schools. It is, therefore, reasonable that a similar type of learning assistance program would be applicable to other health professions environment.

The presentation will cover the following areas:

1. The learning Demands of the Basic Sciences Curricula (U of I and probably others)

2. Skills Needed to Master the Three Taxonomic Levels or Levels of Understanding

3. The Areas in Greatest Need of Assistance

4. Intervention Strategies

5. A Conclusion

THE LEARNING DEMANDS OF THE BASIC SCIENCE CURRICULA

At the university of Illinois College of Medicine, the learning demands or requirements of the curricula in the first two years and the resultant examination of medical students' cognitive performance center on students' ability to master the taxonomic levels (Cerchio, 1988). In the learning process, these are usually referred to as the levels of understanding which are Level 1 (Literal), Level 2 (Interpretive) and Level 3 (Applied) (Bloom, 1956).

Students performing at Level 1 are required to demonstrate an effort of memory in the recognition or recall of facts and ideas (information). Learning and performance at the second level of

understanding call for the simple interpretation of limited data. That is, students must learn to recall information and develop the ability to translate or show the implications of the data of interest. Level 3 understanding is demonstrated when students can apply knowledge to the solution of a specific problem by fitting together a variety of elements into a meaningful whole. Although items on the Progress Examinations are developed to test the level of mastery of all three taxonomic levels, more items are written to test students' abilities at Levels 2 and 3 (Cerchio, 1988).

This focus of the teaching and learning at the first two years is very instructive for diagnostic purposes, development of students' academic profiles, provision of individual and group skills development instruction, and the evaluation of students performance. The learning skills specialists in our Counseling Center's Academic Skills Program find this expressed and desired objective very helpful.

Additionally, the sheer volume of materials students are expected to master in a short period of time usually exceeds what they have experienced prior to medical school. This makes both cognitive and affective components very stressful for many.

SKILLS NEEDED TO MASTER THE THREE TAXONOMIC LEVELS OR LEVELS OF UNDERSTANDING

The major skills and techniques which comprise the Literal Level (Level 1), Interpretive Level (Level 2), and the Applied Level (level 3) include the following:

Literal Level

Students must learn to locate, recognize and identify explicitly stated facts and ideas. They must be able to recall information; that is, they must be able to retrieve facts and ideas from memory. In terms of recognition, they should be able to use cues and the presence of context to aid in the recall of information. Students should hold information in memory and derive literal meaning from words, sentences and paragraphs.

Interpretive Level

At this level, the learner goes beyond the author's or instructor's literal statements to draw inferences from those statements. That learner (student) should interpret author's or instructor's meaning with the support of evidence from basic information. The ability to integrate new information with old; weave together ideas from content; predict outcomes and solutions; make summaries; determine sense of relationship among events, people and ideas; paraphrase; and draw conclusions are some of the

other major skills and techniques that are required at his level.

Applied Level

At the applied level students must learn to synthesize the author's ideas with their ideas and experiences. They are required to formulate broad principles or generalizations which embrace both sources and be able to express these principles and/or generalizations in oral or written form.

Are all the medical students at the University of Illinois College of Medicine and other medical schools performing adequately at all Levels? The answer is no and regrettably so. These students are obviously bright or they would not have been admitted into such a demanding program. Sometimes, however, their very brightness has masked the fact that gaps exist in their learning and that they may have missed some basic learning steps at an early age.

AREAS IN GREATEST NEED OF IMPROVEMENT

Learning assistance programs such as ours must address the deficiencies of students: the gaps in their learning. We must design programs to enhance the learning or development of appropriate skills. In our over 17 years of providing learning assistance to the College of Medicine students we have found, through diagnosis and in-depth interviews, that the areas in greatest need of improvement are:

(A) Information Processing (Integration of all levels of understanding) and Reading Skills (Levels 1,2,3)

This involves the integration of information, the use of questioning techniques, and the analysis, interpretation and application of information.

Basic to this process is the students' need to further develop their retention skills, critical reading skills and the ability to comprehend what they read. The large volume of reading materials that medical students encounter require that they continue to seek ways to improve their overall reading abilities.

(B) Time Management

Students sometimes lack the ability and desire to manage their time effectively in a very demanding learning environment. They do not set realistic and achievable goals. Procrastination is often a problem and they are unable to use task-oriented weekly and quarterly/ semesterly schedules as effective management tools.

(C) Effective Study Method

Many students do not use effective study systems such as the Learning to Learn (LTL) integrative learning approach, SQ3R or OK5R. Their study behaviors are haphazard of they do not know how to focus in on relevant learning.

(D) Stress Management

The medical school learning environment is a very stressful one and so students need to learn how to manage stress effectively. Specifically, they need to reduce or eliminate the test anxiety that may accompany academic failures or substandard performance or the fear of encountering such failure.

(E) Problem Solving/Reasoning and Thinking Skills

We have discovered in working with Special Support groups, namely students who fail the National Board of Medical Examination, Part I, that failure can be attributed to the inadequate development of critical thinking, reasoning and problem solving skills. Robert Blanc (1982) found similar results at The School of Medicine, University of Missouri-Kansas City.

(F) Test-Taking Skills

Many students are not accustomed to the multiple choice and multiple-multiple format of medical school examinations. They need to be taught how to read and interpret exam questions.

(G) Visualization/Graphical Recognition

Some students do need to develop the skills of mental visualization and to use graphical presentations to aid understanding and recall.

(H) Self-Defeating Behaviors

There are behaviors such as procrastination and inferiority feelings which prohibit the comfortable interchange with one's environment and interfere with desired achievement levels. Students who exhibit these behaviors must learn to identify them, analyze how they are perpetuated and develop appropriate coping skills.

INTERVENTION STRATEGIES

We have utilized the following intervention strategies in our

attempt to help students improve in the areas mentioned above.

(A) Diagnosis

Diagnostic Instruments have been administered to provide additional information on the status of Students' learning. They include the Learning and Study strategies Inventory (LASSI), the Canfield Learning Style Inventory (CLSI), Myers-Briggs Type Indicator (MBTI), Lawson's Test of Formal Operations, The Nelson-Denny Reading Test, and the Quick Neurological Screening Test.

(B) Individualized Instruction

Multiple individualized instructional sessions are conducted in specific areas of demonstrated need throughout a given quarter.

(C) Workshops

One or multiple-session workshops are offered during the quarter. They focus on various learning skills topics and issues of concern to students.

(D) Self-Instructional Materials

Students use self-instructional materials of the Learning Laboratory in writing, reading and mathematics under the guidance and supervision of a learning skills specialist.

In addition to the strategies we have used and developed in our Academic Skills Program, we have found several other formalized programs helpful such as the Supplemental Instruction (SI), developed by the Learning Skills Specialists at the University of Missouri-Kansas City and the Learning to Learn (LTL), developed by Marica Heiman in Cambridge, Massachusetts. We have had to adapt these programs to fit the health professional students' needs, but the underlying concepts have proven to be beneficial.

CONCLUSION

Medical Schools admit students of varying backgrounds, abilities, attitude and interest. These characteristics do affect their ability to adjust and perform effectively in the highly competitive environment of a medical school. The poor or incomplete learning that some students undertook before matriculating to medical schools, despite their usually impressive academic records, leave them to seek learning assistance from College Learning Centers. We must therefore close by stating that medical students now require and will require the assistance of college learning centers.

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TUTORS AND TUTEES: LEARNING TOGETHER

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INTRODUCTION

Wayne College, The University of Akron's only branch campus, is an open-admissions institution; our entering students vary widely in their academic, social, and cognitive levels. Some of the college's 1,200 students plan on a four-year degree followed by graduate school, while others seek a one-year certificate. It is a college philosophy that all students need help at some time in their college experience; therefore, the Learning and Writing Centers offer free academic assistance to everyone.

Increasing numbers of students choose to come to the centers for tutoring--in ten years, hours worked have risen from 463 to 33,745--so we must be doing something right! Yet we are constantly challenged to support the intellectual validity of our work. Implicitly or explicitly the tutoring centers are viewed as "fix-it shops," clearing up the messes left behind by inadequate high school educations. To take what we see as our legitimate place in the intellectual life of our institution (not to mention getting an adequate slice of the budget), we needed some concrete evidence that effective learning takes place in a tutoring session.

Probably every director of a tutoring program has anecdotal evidence similar to what we both often hear, that tutors recognize the academic benefits that come from being a tutor (Harris, 1987; Bell, 1981). We thought, therefore, that research focusing on tutors' learning would be an appropriate way of establishing the intellectual value of our programs. In the research reported here, the voices of these "good" students, our peer tutors, describe what kind of learning tutoring is, and show its value for the academically successful as well as for the struggling student.

An analysis of the responses to our questionnaire has revealed that profound cognitive growth occurred in all of our tutors. In addition, we have observed that although individual tutors varied widely in experiences and outlook, all of our responders seem to have passed through four similar stages as they achieved this growth. These stages were recognizable also in the responses of our student word processing assistants, and in those of the professional tutors as well, but space limitations of this publication require that we focus here on what we have learned from our peer tutors.

QUESTIONNAIRE

The responders received a cover letter or a verbal explanation that we wanted to study the effect of the experience of being a tutor on the tutor's own learning. The questionnaire was designed to trace some of the cognitive processes we think we have undergone ourselves, as tutors, and observed in others over the years. Our goal was to substantiate our seat-of-the-pants conviction that tutoring is a valid, respectable way to learn, for people at different levels of achievement and academic experience.

We hypothesized that improvement in learning ability would change one's definition of effective learning. Therefore, we planned Question 1, "Could you explain what you thought effective learning was when you started as a peer tutor?",as a benchmark: Where does the responder see him- or herself as starting, cognitively?

Question 2, "When you first began tutoring, what method did you use to help your tutees solve their learning problems?, hoped to discover the actions resulting from new tutors' abstract learning concepts. Most responders' concepts did connect strikingly to the actions they described in Question 2.

Question 3, "What surprised you about how your tutees learn?", looks for cognitive dissonance, or surprise, which often signals the need for new ideas and methods. What happens that doesn't fit into one's preconceived intellectual structures? What prompts, if not requires, learning? In other words, we were looking for clues about how learning occurs.

Question 4, "Can you describe a specific tutoring session in which the tutee was unable to grasp the concept you were trying to explain?", asks for a specific time when the tutor's method failed, possibly enabling the tutor to recognize an undeveloped concept about learning.

Question 5, "Could you describe a session where the learning experience seemed to be particularly effective?", offered the opportunity to illustrate the responder's growth as a tutor, as reflected in a successful session.

Question 6, "How have your decisions in choosing questions and explanations while tutoring changed with tutoring experience?", was designed to enable the responder (having considered where he or she started, what methods were used initially, what didn't seem to work, and what did) to reflect on any changes in method of tutoring.

We hoped this progression of questions would enable our tutors to create what William Perry (1981) calls a "coherent interpretive framework" (p.77) about their tutoring work. Of course as it is

being done, tutoring is necessarily incoherent, in many separate segments, with repeating tutees or single-time visitors, over many semesters.

Question 7 and 8, "What have you learned from being a tutor? Have your ideas about effective learning changed? If so, why and how?", look for specific evidence of cognitive growth: Where has the responder come since the benchmark ideas of Question 1? We were expecting a new, more sophisticated definition of "effective learning." Many responders told us what they had learned about being a tutor, but all sorts of other results came to us also. The goal of this research project was to gather together the many pieces of thought and experience stored in our tutors' long-term memories, to analyze them, and to construct from them a theory about the cognitive basis of our work.

RESEARCH RESULTS

As we had suspected, we saw a significant difference in the responses of tutors who had tutored only one semester compared to the responses of those who had tutored for four years. Experienced tutors changed from giving the "right answers," to figuring out misunderstandings, asking better questions, and having the tutee do more talking. They came to realize that affective factors are as important as cognitive growth and that tutees' incorrect study methods are the cause of many learning problems.

All tutors with at least several semesters of experience passed through four basic stages of growth: first, a focus on giving the right answer; second, development of skills at presenting information in a variety of ways, not just the one way that had worked for the tutor; third, greatly increased mastery over subject matter, related to the need for so many different ways to present it; and fourth, a growing awareness of the importance of the tutee's attitude toward learning and approach to studying. This awareness of individual needs and difference is a significant change from beginning tutors' simple reliance on getting their tutees' assignments done correctly.

At first tutors generally thought that the better they could answer questions, the better the tutee would learn. A beginning tutor, Lance, stated this idea: "[Initially I thought] effective learning was working through a lot of homework problems while understanding the concepts behind the solution." Marvin thought that tutoring was doing homework and practicing more problems: "In math, it appears to be best to go through the problem very slowly at first, then once [the tutee] understand(s) the problem, keep doing more of them until (he) get(s) a feel for them." Another beginning tutor summed it all up: "Practice makes perfect."

Beginning tutors wanted to help tutees "pass the test,"

essentially assuming the tutees' responsibility for learning. Cheryl thought "helping a student so he could do his homework effectively and apply it to his quizzes and tests" was effective tutoring. Jennifer, a tutor with one semester experience, definod tutoring as: "...picking your questions to weed everything you can out of your tutee--but you answer as basic and clear as possible."

The second step in the development of tutoring skills, after just giving the "right answer," was an effort to explain the concepts behind the answers. New tutors tend to explain as they themselves were taught. Yet over time, tutors realize that there is more than one way to learn. One chemistry tutor said, "Some [tutees] want problem solving techniques broken down and spelled out. The tutee may want to memorize the procedure for solving certain sets of problems. Understanding may or may not come later on, but some people seem to have to learn that way. Others wish to develop their own solutions and simply need to know what is wrong with their method of solution if it happens to be wrong."

Another tutor made a similar discovery when working with math problems: "I learned to force myself to look at problems from a variety of angles. I believe I am better able to understand people's problems, and have increased my listening skills also." Tutors initiate changes in tutoring methods when they realize their ideas or methods aren't helping the tutee. Their dialogue enables the tutor to analyze learning and adapt his or her method to the tutee's intellectual needs.

The responses of another tutor who tutored for four years illustrate this growth: "I would show several ways to solve a problem too early. It is important to know the tutee well enough to know when to show him or her a second or third way of looking at or solving a problem. Sometimes a second method is helpful. Sometimes it's harmful depending on the student."

The one theme we noticed in all returns of experienced tutors was that experienced tutors move from a reliance on rote memory to an awareness that both tutor and tutee need a broader scope of knowledge. One responder pointed out, "I...learned things I had missed in my classes. Tutoring is also a great way to review and keep up on old material."

Only after this mastery is achieved do tutors' responses show an awareness of another major factor in cognitive growth, the tutees' feelings and attitudes. Tutees need more than "the right answer" and different methods of finding it. As tutors' experience increased, they saw that their tutees needed study techniques, praise, and individualized explanations. One tutor said, "It surprised me that a friendly face seemed to help as much as anything." Tutors begin to realize that tutees need less help and more encouragement. The one-on-one tutoring session removes all distraction and pressures, and allows the tutee to concentrate more

fully. A tutor pointed out, "To a certain degree, I began to realize that encouragement is very important, and also recognized the negative effect that nervousness and pressure can have on learning." Mary added, "Some tutees just need the reassurance that they are doing the problems right. They are perfectly capable of doing the work themselves, but just seem to lack self-confidence."

As tutors became more experienced they became aware that the tutees' feelings affected not only how they learn, but also how they studied. One tutor said, "Once they learned a few things they previously did not understand prior to the tutoring, they became much more easy to work with and help along. Many tutees I found have high learning potential, but their method of study is usually the primary deficiency or limiting factor in learning...." Another tutor was surprised by her tutees' simplistic attitude toward studying. She wrote, "Sometimes I thought that they must never think. They want someone to tell them one simple thing that applies to everything. Many were not willing to do the practice required to achieve real understanding." Another tutor was "a bit surprised at the amount of rote memorization most of them attempted as a substitute for understanding. The prevalent attitude was to memorize the material long enough to pass the test, then forget it."

This completely inappropriate approach to academic work was similar to the discovery another tutor made about some struggling tutees. She says, "I found breaking math problems into small steps was effective. It seems that too often tutees try to skip over steps to get through a problem faster and then end up with an incorrect answer." Extended experience in tutoring enabled the tutors to understand these affective problems well enough to lead the tutees to develop more effective learning.

SUMMARY

The first stage traced in our research was for the tutors to answer questions. At this stage the tutors focus on establishing "the right answer." From that position they eventually move to a second stage, recognition that the right answer is useless unless the tutee understands the concept behind it. Then tutors realize that they can't explain the concept only as they learned it or as it made sense to them, because tutees' learning styles are so different. The necessary ability to explain something "sixteen different ways" comes only with mastery over the subject matter, worked for increasingly in the third stage of cognitive growth. Finally, tutors come to recognize that even this mastery is not enough because learning can only take place within the tutee. The tutor can only guide the cognitive growth; the tutee is entirely responsible for his or her own learning. At the fourth stage the tutor becomes sensitive to the tutee's feelings, attitudes and

approaches to studying. Experienced tutors now have a wide range of ideas, skills and perceptions available to them as they strive to help each tutee learn in every way possible and to continue their own academic careers.

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MANAGING STUDENT LEARNING: THE TEACHER AS CURRICULAR EXPERT
A Response to William Bennetts Criticisms of American Education

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WILLIAM BENNETT: POOR TEACHERS MAKE POOR STUDENTS

Addressing the Illinois legislature while still Secretary of Education, William Bennett stated that teacher quality is the most important factor affecting student learning, even ahead of student/teacher ratio and per-student funding. The problem with education, according to Mr. Bennett, is that many teachers are incompetent. The way to improve education is to improve teacher quality, which will be accomplished by requiring teachers to pass objective tests of mastery in their subjects (Bennett, 1988),

FOUNDATIONS OF CREDIBILITY OF MR. BENNETT'S CRITICISMS

Mr. Bennett derives substantial public credibility by forthrightly addressing a problem which is widely acknowledged: the decline in achievement of the graduates of many of America's schools and universities. Educators, who in general readily acknowledge this concern privately but are often unwilling to do so publicly, sacrifice our own credibility as a profession by not facing squarely up to it. In doing so, we create a vacuum which critics such as Mr. Bennett can step into and capitalize upon for political purposes, to the detriment of teaching as a profession.

Mr. Bennett gains credibility for his criticisms of education and educators, and therefore also his prescriptive recommendations, when he points out that school systems generally do not evaluate teacher performance to identify and weed out inadequate teachers, and particularly when he compares educational organizations with business organizations, where the need to evaluate worker performance and improve or replace incompetent people is at least widely acknowledged, if not always implemented. In academia, the historically acknowledged--if not always implemented--valuation of freedom of thought presents a qualitative dimension in the evaluation of teacher competence that other kinds of organizations don't have to include in performance appraisal. However, we can't use academic freedom as an excuse to avoid evaluating our work.

SHORTCOMINGS OF MR. BENNETT'S CRITICISMS

Teaching is a profession with its own integrity, which extends beyond subject mastery and homework assignments. Mr. Bennett, ignoring this, diagnoses the problems of teaching and prescribes solutions for them too superficially. Although some teachers are lacking in subject mastery, and/or are insufficiently demanding of

students, these are not, it seems to me, the fundamental problems of teaching as a profession. The real problem it seems to me, is that teachers often don't know how to teach.

MANAGER TRAINING AND TEACHER TRAINING

An analogy with management training is relevant here; teaching and management have much in common. The task of the manager is managing subordinate productivity, and the task of the teacher is managing student learning. Few people become manage's because they know how to manage; most become managers because they are good at making things or delivering services. When they become managers, however, they find themselves rather unprepared for their new responsibilities, especially hiring, orienting, directing, evaluating, promoting, disciplining and terminating subordinates. These skills require new conceptual and human relations skills in the manager. Those who cannot make the adjustment fail as managers, however good they were as non-managerial workers(Einhorn, 1986).

FROM SUBJECT COMPETENCE TO CURRICULAR COMPETENCE

Similarly, the new teacher has to make the transition from subject competence to curricular competence. As a successful student, the teacher had to know how to learn a subject. As a successful teacher, s/he will have to know how to present a subject to a class in a way that is representative of its field, at an appropriate level for the class to which it is being presented, and that involves students with the subject substantially enough for them to learn something meaningful about it. And, the teacher will have to evaluate how meaningful each student's learning has been, in a way that preserves the integrity of the subject and of the teaching process.

Thus, while Mr. Bennett sees teachers as subject experts and wants to test them to make sure that they know their subjects, this point of view sees teachers as curricular experts who should be evaluated on the basis of whether they can think in curricular concepts and implement these concepts in action. This point of view departs from Mr. Bennett's in holding that it is in their understanding and implementation of curricular concepts that teachers achieve professional stature, not merely in subject mastery or homework assignments, which reduces teaching from a profession to a sort of academic assembly line.

FOUR CURRICULAR FACTORS

There are many ways of thinking in curricular terms. Here, I would like to present four fundamental concepts or factors of curriculum that broadly encompass the main tasks of classroom teaching and which provide a framework in which teachers can be trained and evaluated that, if it is conceptualized and implemented

in a comprehensive and flexible way, will recognize and enhance, not deny and reduce, teachers' professional integrity and skills. These are: subject content goals, subject process goals, student language skills, and student study skills.

SUBJECT CONTENT GOALS

Content refers to the information in a field of study, just the information, not its understanding. Terminology, definitions, technical terms, chronological history, etc., make up the content. No subject's content is taught exhaustively; instead, the teacher has to select a sample of information that is representative of a subject and present it to students so that they can develop some familiarity with the subject and know how to learn more about it later on if they want to. Practically, this usually means selecting a textbook(or books), deciding how much of it and which parts to cover in class, and deciding what additional information, not included or emphasized in the text,to present in lectures and supplemental reading assignments. For purposes of this discussion, the point is not how these content decisions are made, but rather that they are made. These are the content goals of any class.

SUBJECT PROCESS GOALS

In addition to subject content goals there are subject process goals in every class. Process goals are harder for most teachers to identify than content goals because content goals are usually explicit, whereas process goals are often implicit, felt or intuited. An important area of skill development in curricular design and evaluation is to make these implicit objectives explicit, by articulating and specifying them in ways which are subject to study and evaluation(Stenhouse, 1975).

It might be helpful to compare a content goal and a process goal for the same material. When I teach Social Psychology there is certain information that I want to cover. This information includes the classical social psychological experiments in conformity, obedience to authority, helpfulness to strangers, intergroup hostility, etc., and this is the content, contained in textbook readings, supplemental readings, and lecture/discussions. In addition to this content, however, I also have process goals for my students. I want them to think about how this information applies to them personally. I want them to consider whether these classical experiments, with their unexpected results, and their implications that our natures as human beings are quite different than consensus reality socialization trains us to believe, challenge their view of themselves and of society. To me, this research suggests that new ways of understanding ourselves and others may be more realistic than our current views, with profound implications for individual and social decision-making (Lessing, 1987). I want my students to think about freedom from a

psychological point of view, as distinct from a political(freedom to vote), religious(freedom of worship), or economic(freedom of labor) perspective; to begin to understand psychological freedom as a concept with which to observe and understand themselves and others.

Content learning, while it may be the essential first step to acquiring familiarity with a subject in an academic setting, is essentially rote memorization. It is only in the process-oriented applications of a subject that we come to grips with its meaning, and demonstrate whether we have achieved any understanding of it, and to what extent. Knowledge consists of information and understanding, and educational thinkers who imagine that content mastery is the goal of education have less than half the true goal of education within their sights.

Attempts to improve education have tended to consist of changes in curricular content only, such as changes in books or lectures, or else in the methods of teaching content, such as using audiovisual aids. Mr. Benett's comments are squarely in this tradition, when he asserts that teachers don't understand the content in their subject areas. I would argue that the fault is deeper: teachers often don't understand understanding as an operational goal of their curricular development and implementation.

Multiple choice tests are adequate and efficient methods of sampling content learning, but are inadequate for eliciting indications of what students understand about a subject(Stenhouse, 1975). For this, some sort of open-ended examination is required. In my Social Psychology class, for example, I might ask my students to describe occasions when they, or someone whom they knew, were coerced by situational factors into behaving in a manner contrary to their original desires or best interests.

STUDENT LANGUAGE SKILLS

Language is the primary medium of academic education, and one of the goals of academic teaching is to produce individuals skilled in the use of language to express ideas, communicate experience, and extend their own learning. Students not only have to learn new words in their classes, they have to develop new ways of construing their lives, based on, and expressed by means of, concepts encapsulated in language. We can define as a basic criterion of academic success that students should be able to communicate more effectively about a subject at the end of a period of study than they could when they started it. When students complete classes having acquired no new language, and no new understanding of their existing language, it is difficult to see how they can be said to have learned anything.

STUDENT STUDY SKILLS

It is one thing to bemoan student unpreparedness, another to design study skills training into the curriculum of most classes. This means that student evaluation, too often reduced to giving tests to obtain grades, must be applied more for feedback and only secondarily for grading; in most classes, substantially more often than once or twice a term. Students have to study teachers, but teachers have to study their students as well. When students are floundering, or not doing as well as they want to, the teacher response is too often to weaken the curriculum content, lower grading standards, or, alternatively, to ignore the students' distress and bulldoze them out. Instead, we should be helping students to diagnose their study problems and learn to study more effectively. This may include learning how to take notes, write chapter outlines, study for exams, and form study groups. Even in this helpful role, we can be appropriately firm: if students are trying to do too much in their lives and need to cut back to make more time to study, we can point that out to them. Our role is not to give students everything they want, but to help them to unlock and apply their potential to learn.

EVALUATING TEACHER PERFORMANCE

At the end of the term, the record of student performance on examinations of various kinds, indicating <u>both</u> overall quality of work <u>and</u> improvement in quality throughout the term, provides substantial, and perhaps the best, feedback about <u>teacher</u> performance.

The fact is that the integrity of our educational systems at all levels has been seriously compromised by our inability, as a profession, to teach comprehensively; our unwillingness, as a profession, to give students the performance evaluations that they deserve; and our refusal, as a profession, to subject our work to appropriate critical appraisal. As the public dissatisfaction with teaching, which Mr. Bennett capitalized upon so effectively, swells, the question is not <u>whether</u> teachers and teaching will become more accountable, but <u>how</u>, whether the standards of accountability that will be applied will be in harmony with the most fundamental concepts and values of teaching, or destructive to them.

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THE KEY TO SUCCESS
A NONTRADITIONAL READING PROGRAM

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Christine Poziemski
William Rainey Harper College

William Rainey harper College has developed a unique remedial reading program that has significantly improved students' reading comprehension. We used none of the conventional methods that are often taught in reading classes. Ironically, we did not formally teach reading comprehension. Instead, we presented reading materials through a holistic approach that incorporated reading, discussion and writing.

During the school year 1988-1989, we piloted this nontraditional reading program. Forty-five students took part in the pilot program, and seventy-three students comprised the control group. A more traditional reading program was taught to the control group, one in which "main ideas," "details," and other components of reading comprehension were presented through a textbook format.

The Degrees of Reading Power Test (DRP) was used to evaluate the programs. The results of the pilot group were dramatic. While the average increase on the DRP for the control classes was seven points, the average increase for the pilot classes was fourteen points (see Appendix A).

The student evaluations of the class were all positive. Following are responses to the question, "What aspects of the course were most beneficial to you?"

- "I like expressing my opinion in class and hearing everyone else's opinions."
- "It has helped me to think more for myself."
- "Everything."
- "I enjoy coming to this class. I feel comfortable talking in this class."
- "Everything was beneficial to me because I learned a lot of things that I didn't know before."

Objective evaluations of the class were also extremely positive (see Appendix B).

TECHNIQUES

Three of the techniques that were so successful in our nontraditional program will be described.

Technique #1: Group Interaction Activity

This pre-reading activity had three purposes. First, it piques the interest in a particular subject or article. Second, it activates the reader's background. Third, it creates an atmosphere conducive to discussion and the sharing of ideas. In the following group interaction activity, the students are given five minutes to circulate around the room, soliciting signatures of people who "would like to be thinner" or represent other attitudes that are expressed in an article about modern society.

Group Interaction Activity

FIND A PERSON WHO....	SIGNATURE
1. Is Thrifty	_____
2. Attends Church Regularly	_____
3. Owns A Copy of A Norman Rockwell Print	_____
4. Has At Least Two Friends Who Are Divorced	_____
5. Has A Friend Who Has Undergone A Facelift	_____
6. Would Like One of Their Children To Become A Social Worker	_____
7. Spends at Least One Hour A Day Watching Television	_____
8. Takes at Least Four Aspirin A Week	_____
9. Thinks That There Is Too Much Violence on Television	_____
10. Would Like To Be Thinner	_____

Technique #2: Reaction Guide

A reaction guide is very successful as a reading/thinking activity because it encourages active learning. Students examine their own values by responding to statements from an article. They also examine the values of others and become better able to organize their own thoughts. Eventually the students exhibit higher level thinking over the course of the semester.

In the following reaction guide, statements are presented that are implied in an article about values. After reading the article, students are asked to agree or disagree with the statements. They are then polled as a class, and a discussion ensues in which group interaction and clarification of reasoning is encouraged.

Reaction Guide

WHAT ARE OUR REAL VALUES?

AGREE	DISAGREE		
_____	_____	1.	The American dream is reflected in our advertising.
_____	_____	2.	Success is the most important value in today's society.
_____	_____	3.	Our society encourages the use of drugs.
_____	_____	4.	Violence should be outlawed on television.
_____	_____	5.	The sale of pornography should be banned.
_____	_____	6.	Elderly people should be placed in homes for the aging.
_____	_____	7.	The church has very little power today.
_____	_____	8.	Convicted felons should not profit from publishing autobiographies.
_____	_____	9.	America is a nostalgic society.
_____	_____	10.	Life was better twenty years ago.

Technique #3: An Application of the Circle of Knowledge

The Circle of Knowledge technique, adapted from Hanson, Silver and Strong, encourages higher level thinking and increased participation. The teacher chooses a textbook concept or article to discuss in class and then develop questions that require the students to think about a subject in different ways. (see Appendix C).

For example, in discussing an article on the legalization of drugs, a teacher might formulate one question to ACTIVATE the students' background information.

Question #1

"What do you know about the drug problem?"

At this time, each class member takes a few minutes to write down everything he/she knows and can remember about illegal drugs and the problems that drugs cause in our society. Next, each student turns to the person sitting next to him/her and shares or explains the written response. Then, the instructor uses a "go-around the room" technique to collect responses. In this technique each student responds to the question and the instructor records all responses, unedited, on the overhead or chalkboard. The same strategy is followed for each of the remaining questions.

The second question asks students to use their ability to REASON. They can explain, compare or contrast in relation to the topic.

Question #2

"How do you think the drug problem should be solved?"

Once again, time is allowed to write out responses, to share and to collect.

The third question asks students to APPLY their knowledge, to be creative, and to generate solutions.

Question #3

"What would happen if we legalized drugs?"

The fourth question gives the class an opportunity to REACT.

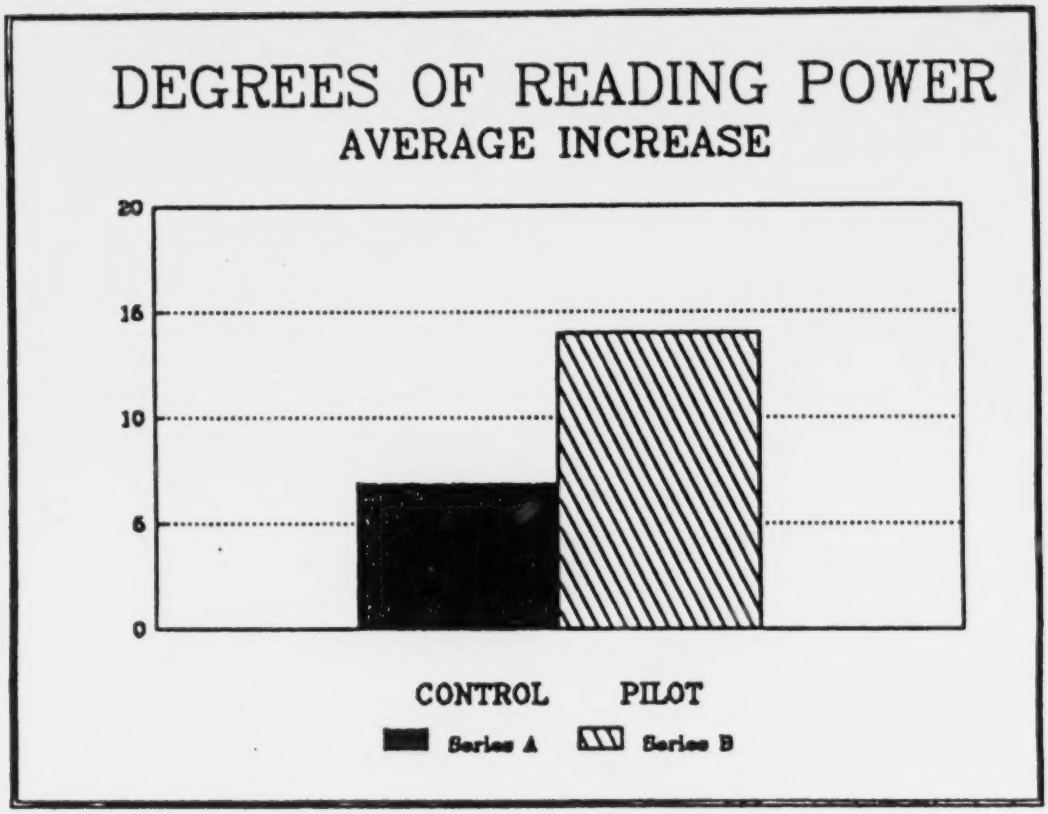
Question #4

Fill in the blank: The solution for the drug problem is a matter of _____.

or

"What do you have to say to the author of this article?"

There are several benefits in applying the Circle of Knowledge Technique. Because every student responds in writing and responds orally to every question, classroom participation becomes mandatory for all, not just a few, students. Second, students gain confidence from writing and checking out their responses with other students. They observe that the teacher cares enough to acknowledge their responses in a positive manner. Finally, adapting the Circle of Knowledge technique to specific classroom content of articles stimulates higher level thinking in the classroom.



CONTROL - 7

PILOT - 14

Appendix A

	% OF SATISFACTORY RESPONSE
PREPARATION AND USE OF CLASS TIME	100.0
CLARITY OF EXPLANATION AND EXPRESSION	100.0
VALUE OF ASSIGNED MATERIAL	96.6
GRADING AND EXAM PRACTICES	100.0
APPROACHABILITY	96.6
GENERAL COURSE ORGANIZATION	100.0
OVERALL RATING	100.0
SUMMARY OF ITEMS 1 THROUGH 7	99.0

Appendix B

1. *ACTIVATE*

What do you know about the drug problem?

2. *REASON*

How do you think the drug problem should be solved?

3. *APPLY*

What would happen if we legalized drugs?

4. *REACT*

Fill in the blank!
- Solution for drugs is a matter of _____.

- Write your response to the article by Mike Royko.

TUTOR TRAINING: TUTOR TRAINING WORKSHOP

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The workshop leaders began with a brief overview of their underlying theories and assumptions about collaborative learning and individualized instruction in tutoring as well as tutor training, emphasizing especially that tutor training must be individually structured by each director in terms of the facility in which the tutors work and the theoretical assumptions and orientations of the director. The workshop leaders then focused on answers to the questions listed below by offering their suggestions for answers and soliciting responses from the audience in a collaborative effort to broaden the pool of possible choices for answers. Several packets of materials were distributed to serve as additional resources.

What is tutoring? (Tutoring vs. Teaching)

.interactive

.individualized

.non-evaluative

.collaborative

.focused on specific, limited topics

How are tutors selected?

.standards

.possible pools of applicants

.selection procedures (interviews, written applications, teacher recommendations, etc.)

Of what use is the Myers-Briggs Type Inventory (MBTI)?

.discussion of the MBTI and applications to tutoring

What are the goals of tutor training?

.learning to establish agendas (diagnosis)

.developing tutoring skills (listening, questioning, etc.)

.acquiring tutorial strategies

.handling tutoring problems (and problem students)

.enhancing personal growth

What are some of the formats for training?

.credit courses

.workshops

.weekly meetings

How can tutors' abilities be evaluated?

.formal

.informal

What are some activities for tutor training?

.videotapes

.mock sessions

.reading assignments

.reviews of materials to be tutored

.journal writing

.observations of other tutors

.writing tutoring tips

.self assessment

TEST ANXIETY: WHAT IT DOES AND WHAT CAN BE DONE

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Rita Weinberg
National-Louis University

TEST ANXIETY: DEFINITION OF THE CONSTRUCT

Test anxiety causes performance deficits in both academic and vocational settings. The construct of text anxiety is comprised of a cognitive factor (worry, or thoughts about failing and the resulting negative consequences) and a somatic factor (emotionality; the indicators of autonomic arousal present when the body prepares to meet an emergency; Deffenbacher, 1978; Liebert & Morris, 1967; Morris & Liebert, 1970). Only worry has been demonstrated to interfere with cognitive processing in ways that impair learning. This paper examines the ways in which test anxiety impairs learning and outlines a strategy for reducing learners' levels of test anxiety.

THE EFFECTS OF ANXIETY ON TEST PERFORMANCE

Easterbrook (1959), Geen (1976) and others have demonstrated that anxiety causes learners to ignore some portion of the available information present within a learning environment. But it is the nature of the learning task that determines which type of information will be ignored.

Single Central Tasks

For tasks in which learners are required to do one primary function (i.e., a single, central task), and which contain some mixture of task-relevant information (i.e., essential information that is required for accurate task performance) and task-irrelevant information (i.e., extraneous information that is of no help in task performance), the following two information processing rules apply. First, both anxious and non-anxious learners exclude task-irrelevant information before they exculde task-relevant information. Second, anxious learners exclude more task-irrelevant and task-relevant information than do non-anxious learners. Using these two rules, it has been found that for tasks that have a predominance of task-relevant information, anxious persons ignore more task-relevant information than do non-anxious persons, leading to performance deficits for anxious persons. For tasks that have a predominance of task-irrelevant information, anxious persons ignore more task-irrelevant information than do non-anxious persons, resulting in a performance benefit for anxious persons. For tasks that have equivalent amounts of task-relevant and task-irrelevant information, moderately anxious persons outperform both high and low anxious persons, as the former are able to ignore most of the task-irrelevant information and attend to most of the task-

relevant information.

Tasks Containing a Central and an Incidental Task

Some tasks contain two functions to be performed by the learner, with one function being designated primary (i.e., a central task) and the other function being assigned secondary importance(i.e., the incidental task). On these tasks, anxious learners pay more attention to the incidental task than they do to the central task, with non-anxious person showing the reverse pattern.

Timed Tasks

For tasks that must be completed within a designated time limit (i.e., timed tasks), it has been demonstrated that anxious persons perform poorly relative to non-anxious persons, and perform worse on timed tasks than they do on untimed tasks. When learners are instructed to take as much time as they need to complete a task, anxious persons work more slowly than do non-anxious persons, while instructions that stress speeded performance cause anxious learners to work more quickly than non-anxious learners (Leon & Revelle, 1985).

EXPLANATIONS FOR THE EFFECTS OF ANXIETY ON TASK PERFORMANCE

Two explanations have been proposed to account for the aforementioned effects of anxiety on various types of tasks. First, anxiety has been found to divide a learner's limited attentional resources between task-relevant activities (i.e., performing the designated task) and task-irrelevant activities (i.e., ruminating about the consequences of failing at the task; Sarason, 1980; Wine, 1971). This places anxious learners in the position of doing two tasks simultaneously (the designated learning task and the task of worrying), and both reduces available attentional resources (which causes some portion of information to be ignored), and slows down performance (it takes longer to do two things simultaneously than it does to complete a single task). Second, anxiety reduces short-term memory capacity (Eysenck, 1979), which also slows down information processing speed.

These two events, i.e., the impairment of attention and short-term memory processes, account for the observation that anxious learners ignore some portion of the available task information and perform poorly on time-limited tasks. The proportion of task-relevant to task-irrelevant information contained within the task then determines which specific pieces of information are likely to be ignored.

INTERVENTION STRATEGIES

We have described the effects of test anxiety on mental processes. Personal reaction to text anxiety is often paralyzing. It takes energy and attention away from the task at hand. The victim feels a lack of control over his thinking and memory.

Discouraging internal voices further distract the subject's attention and energy from the test taking process, e.g., "I can never pass tests." Sometimes students anticipate test anxiety and begin to worry far in advance of the test itself. Anxiety then affects their ability to study and retain information. This is analogous to airplane anxiety, where the thought of flying precipitates an anxiety reaction.

Who Becomes Anxious?

Anxiety is not limited to a particular type of student. We have treated very bright, highly motivated students who studied hard but who were very anxious about taking tests and did poorly on them. One student at Yale University had little confidence in her ability. She experienced great anxiety about taking tests and performed far below her capability on them. By assisting her to increase self confidence, and by changing several test taking strategies, she was able to score at the 98th percentile on Graduate Record Examination (GRE).

Anxiety blocked the short term memory of a learning disabled high school student. Whenever he walked into a room to take a test, he felt "My mind went blank." We helped him to access a more confident state and had him focus on memory strategies, instead of his own anxiety. This led to more successful testing experiences for him.

Learning disabled students frequently experience test anxiety, often based on years of unsuccessful test taking. They usually need more time, strategies for test taking and improved study skills as well as more confidence.

In this section we present techniques to reduce test anxiety allowing the students to focus more on taking tests. The most effective interventions are those which either prevent arousal of anxiety or diminish its emotional power.

Our intervention concentrates on the two areas discussed earlier, cognitive and emotional. Each interacts with the other. Students who develop more efficient cognitive test taking strategies feel more in control and, therefore, better about themselves. Students who feel better about themselves can focus more of their energy and attention on the test taking strategies.

Learning and Study Skills

As they learn and study, students must learn to take notes well, to organize and group topic areas while studying as well as to employ effective memory retention and recall skills; and to allow sufficient time for learning and overlearning. Lack of motivation can lead to a variety of avoidance tactics. However, giving the student specific strategies and working with them closely until these strategies are comfortable will usually dispose of motivational issues.

Strategy Interventions

Prior to the test, give the student something to think about other than his own anxiety.

A. Change discouraging internal messages into more confident messages. ("I can do this".)

B. Change the mental picture of themselves failing to one of themselves succeeding.

C. Change ineffective test strategies including: Mnemonic memory associations, allotment of time for sections of test, arranging for untimed tests. Use rehearsal and role play to help student become familiar with new strategies.

Changing Test Anxiety

Gather detailed information from the student about how the anxiety begins, what happens during study and test-taking periods, and where there are specific difficulties (e.g., "I can't remember what I studied"; "I skip parts of questions.")

To help students tap into their own abilities we suggest the State of Excellence technique. We have used it successfully many times. This can alter the person's internal state from a negative frame to one of feeling more positive about himself.

State of Excellence Technique: Have the subject recall a past experience where he/she has performed or done something very well, a time they were really proud of themselves. As the person does this have him visualize and remember himself operating more competently and confidently; get a good detailed picture; then hear himself confidently saying good messages to himself (e.g., "I can do this really well") and, most important, feel those good confident feelings inside himself. It is the change in <u>feeling</u> we want the person to achieve. This should put the student into a more confident frame of mind for taking a test.

Anxiety Separation

This technique can be used when the student becomes highly anxious. It is designed to reduce the power of the anxiety reaction. It effectively relieves and separates the strong emotional component from the anxiety so the student can focus all his/her energy toward taking the test. This gives the student a way to control anxiety.

Have the student imagine he/she is performing in a movie. The screen must be far away and distant. Watching the screen from a distance (far away so the anxiety is not activated) have the person run the movie of himself taking the test from beginning to end. When completed, start the movie at the end and run it backwards to the beginning. Do it backwards five times, always starting at the end and working back to the beginning. Bring screen closer and run movie from beginning. The anxiety should be greatly diminished or gone. Finally, using above techniques, role play student taking future test situations until the student feels confident and comfortable with new strategies.

Carefully analysis of students' behavior around learning, studying and test taking, as well as about his state of anxiety can allow useful intervention strategies tailored for the individual student. We have discussed the effects of test anxiety on brain functioning, how to assess the specific problems students are encountering and have given several techniques to diminish the effects of test anxiety.

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TESTS THAT TEACH

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Buzz words are extremely popular in modern society. Knowledge of "in" topics somehow seems to place an individual a step above his uninformed colleagues and utilization of key phrases may influence administrators to believe that we are truly up to date and are practicing what are considered the current trends.

Several buzz words popular recently for higher education include "learning styles," "Writing centers," "Writing across the curriculum" and "Thinking skills." It is also in vogue to be able to quote E.D. Hirsch and Alan Bloom and to practice intensive student as well as self evaluation.

All this is fine so long as it is an honest attempt to grow, but far too often I believe that individuals are conversant with principles and concepts but rarely understand or put them into practice in real life. Instead they are convenient but empty semantic devices that indicate an individual is up-to-date on educational theory while in fact, nothing could be so far away from the truth.

My topic this afternoon is about a buzz word - creating tests that allow, perhaps even force students to think for themselves. One might assume that such a skill is a prerequisite for any learning, yet as I examine my colleague's evaluation tools, I find that assumption quite inaccurate.

Few Professors seem to analyze the purpose their tests serve and whether they are a more adequate measure of the pupil or the teacher. Many tests encourage students to recite a simple regurgitation of the facts provided in lectures; seldom do we look for original thought, and if one is present, it is likely a fluke we are unprepared for. Final exams seem designed for quick grading rather than for a solid analysis of skills attained and retained.

Vol.3 Number 2 of The Teaching Professor suggests that empirical evidence shows that teachers do almost all the work in a college classroom. (p. 1) Unfortunately, the students in such watch-me-do-it classes are ill-prepared because their learning has been passive rather than active. It is no wonder they are disturbed when an occasional odd-ball prof suggests that to really evaluate learning, instructors need to see how the student applies what he knows rather than merely how meticulously he can repeat it. Teaching students that they can and should think for themselves and avoiding tests which encourage them not to think is a major challenge faced by educators today.

There is no doubt that students would rather have us do the thinking. They like having it done for them and resist the efforts we spend to get them involved. They have quickly discovered that thinking is work and that work is often uncomfortable. Therefore, they conclude that it is for professors. Unfortunately, many profs rise to the occasion and accept the burden. They attend professional seminars like this one, subscribe to professional magazines, and organize in-service programs in order to meet and answer the current outcry about educational inadequacy. They never stop to think that by accepting the burden of responsibility, they are contributing to and even intensifying the problem.

Surprisingly, however, not many are motivated to explore paths like the one in Robert Frost's poem, "The Road Not Taken", paths that could make "all the difference." Instead, like Frost, although harassed a bit more, they continue to plod carefully along in the footsteps of others, for fear that if they step out of line and march to a different drummer, they will surely be labeled as academic misfits and will be unpopular with the student body as well. Perhaps they fear that they will become just as unpopular as thinking is. Somehow it seems that knowing the buzz word is important, practicing it is not.

Here is where academic chairpersons need to play a role. Despite the fact that most chairs believe they have a competent staff, they cannot and should not assume that the evaluative tools these instructors create encourage and promote critical thought. In fact since many instructors cast leary eyes at new methodology, (for example the reader/response theory or deconstructionism in literature) it is not unlikely that the same individuals will persist in testing practices and techniques that were used by their instructors and their instructors before them.

A personal incident reinforces this. Early in my career I taught at a high school and tried to implement thinking skills into my classes and my tests. Five years later one of my former students returned as a colleague. Although she had experienced the challenge of thinking, I found that her college experience had reinforced her belief that only facts and details were important in literature. She organized her class around her expertise, and her students were given the benefit of all her college notes as well as all her college tests. Although her testing might have resulted in some learning, it rarely created independent thinkers, and many times created obstacles rather than bridges to knowledge.

Some no doubt will protest that the teaching of thinking and giving thinking tests takes too much time. But as prof. Vincent Ruggiero notes in his book Teaching Thinking Across the Curriculum, there are benefits for both teachers and students that outweigh the time factor. First such emphases increase student mastery and retention of materials. As an old adage states: "Using knowledge prevents losing knowledge." Secondly, utilizing such skills

develops intellectual abilities associated with excellence and leadership. Finally, it transforms student apathy into enthusiasm and prevents teacher burn-lout. Ruggiero argues convincingly that the mind-deadening repetition of data will be replaced with a vitality that encourages excitement and involvement in the learner. The price in terms of hours spent will be rewarded twice over with quality interaction.

Having dispensed with the objection of time, there are still other compelling reasons why tests that teach should be implemented in the classroom. According to Carol P. Barnes article, "Questioning in the College Classroom," professors contribute to the non-thinking atmosphere of their classrooms by asking mostly cognitive memory questions in order to recapitulate and clarify factual information. Barnes' study indicates that over 63% of all questions asked are of this type while divergent and evaluative categories account for a mere 5% combined. (p. 61-81)

Such patterns no doubt lead students to expect boring and mundane questions based on the book or on the lecture notes. At times they may even be offended at the trivia they are expected to remember. Since they are not trained to expect challenges, they are often at a loss when they are confronted by one. Recently a student stopped me at graduation excerises and thanked me for a class I had taught in World Literature. The student was not an English major so I was surprised at his compliment. When I questioned why the course was valuable to him, he replied that he was on his way to graduate school, and further commented that he felt my course was the first one where he was required to think, an attribute he felt sure he would need to exercise in order to get his Masters' degree.

In another situation one of my students came to the front of the class and asked hesitantly. "Is this what you want here?" The emphasis wasn't on the pronoun, but I felt that what he was really asking was "Have I remembered it the way **you** told it? Have I got it **your** way. When I reassured him that were many ways to answer the question and that the validity of his response depended upon his ability to support his idea, he looked at me quizzically and seemed bewildered. Obviously he had not confronted a class before where he was required to think and to make valid choice. It was likely that he was used to his professor having all the answers.

In order for these students to grow I believe thinking skills must be incorporated into the curriculum. Although Costa and Presseisen contend that nurturing critical and creative thinking is quite easy once a few basic questions have been learned, academic chairs must consider that few PhD's have had exposure to education courses and innovative teaching techniques. If my doctoral training is any indication, few tests given by professors phrased questions so that I was required to evaluate situations, verify information, seek logical evidence or clarify details. Instead I

was asked questions like the following: List chronologically the significant events in Wordsworth's life and what changes resulted in his personality. The material had no doubt been provided in the lecture, but it was seldom that I felt as if I had any leeway of interpretation, let alone any motivation to think.

It is no wonder then that many first time profs avoid higher order questions. First of all they take preparation and secondly they take time to answer. Exulting in new found authority and prestige, most new profs are anxious to exhibit their own expertise rather than helping their students develop new skills. Fortunately, the dilemma is being recognized on some campuses and action is being taken.

For example, Joseph James and Diane Hauer of Syracuse have developed a program for their teaching assistants entitled Now What! Their collection of essays centers on surviving and even enjoying first time college teaching, and offers a concise introduction to asking higher order questions. As Susan Watkins states in the November 1988 edition of The Teaching Professor T.A.s as well as new instructors must realize that the process of evaluation is a difficult one and should be a learning experience as well as an evaluative one. (p. 6)

That can only happen when buzz words become more than conversation pieces. I recently submitted a practical piece to The English Journal on tests that teach thinking on the H.S. level. Approximately three months later it was returned with a comment by the editor that there was little originality in its suggestions. However in my role as supervisor of English Education Secondary student teachers, I see little evidence that high school teachers have been exposed to these ideas. If the ideas in the paper were commonplace and well known, they certainly were not practiced. Few of these cooperating teachers had incorporated teaching thinking and using thinking tests into their instruction.

What I believe The English Journal was saying in its refusal was that the theory has been seen frequently. Unfortunately the editor failed to note the practicality of the suggestions that were posed. (see Appendix A and B for examples.) That was what made the article unique. Instead of theory, it offered solid examples of how to implement the techniques suggested. The buzz words meant something!

Too often teacher/readers nod their heads in agreement with theoretical principles while not possessing the slightest ideas of how to incorporate them into their classrooms. It is the duty of academic chairs to see that such learning becomes practical and is implemented. Hopefully that dimension can be provided by insisting that buzz words like thinking are not empty phrases but rather are related to actual practices attempted by the instructor.

My concern is that recent PhDs need to be trained, encouraged and reinforced in using tests that require that their students to think. That will definitely not happen unless they are exposed to positive role-modeling of the thinking test process.

SAMPLE TEST QUESTIONS
SIMPLE RECALL SHORT ANSWER

Psychology

1. Define what an attitude is, and then describe the three ways in which an attitude may be changed.

2. What are the two limitations of short term memory?

Religion

3. What five things are possible ingredients of a psalm title?

Nursing

4. The central nervous system includes:

History

5. Describe the dual economy in Japanese industry.("The Japan they don't talk about.")

English

6. Explain how Dante decides on punishments in The Inferno section of The Divine Comedy.

SAMPLE TEST QUESTIONS
THINKING
SHORT ANSWER

Psychology

1. Jim believes that he will be successful in basketball. Is this an example of what would be described as an attitude by a psychologist? Is so, tell two ways that this attitude might be changed. If not, rephrase the sentence to include a true attitude and suggest one way it might be modified or changed.

2. Relate the story of Shawn and an experience about memory. Then pose this question: How is what happened to Shawn related to the known research about short term memory?

Religion

3. Using the five possible ingredients of a psalm title, choose one of the following psalams and explain which ingredients are present in it.

Nursing

4. Dr. Haskins' patient exhibited the following symptoms: (list them) Would you consider that the illness of the patient is related to the central nervous system? Explain why or why not.

History

5. Read the following short paragraph on the economic system in Japan. Would the author agree that there is a dual economy in Japan as we have posite in class. Point out places of agreement in the piece or if it does not agree, state what the author's stance might be.

English

6. If Dante were to decide on punishments as he does in The Inferno section of The Divine Comedy, choose two present day felons and suggest what would await them in Hell. Some possibilities are: James Earl Ray, John Wayne Gacy, John Hinckley, Mark Chapman, Jimmy Swaggart, Ted Bundy, Jim Bakker, Oliver North or Richard Nixon, but you may select your own examples. Explain fully the reasoning Dante would have used to justify such sentences.

Appendix B

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EDUCATION: A VISION FOR THE FUTURE

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During this presentation, I'd like to discuss three important subjects:

.The future of education;

.The Knowledge Base Learning Model (KBLM) as the structure for implementing computer-based training programs in the future; and

.The concept of the "knowledge navigator," borrowed from John Sculley of Apple, that postulates a future in which all relevant knowledge is resident in a laptop or pocket computer and is used for on-the-spot problem solving and practical applications.

The items on my agenda are important today, but they'll be even more important as we, a nation and a global community, move into the twenty first century.

According to a recent survey of leading thinkers and Nobel Prize winners from all over the world, An Agenda for the 21st Century, mankind faces six major calls to action as the year 2000 looms ever closer. These include:

.Stemming the decline in education,

.Countering the nuclear threat,

.Easing the population crisis,

.Coping with the deregulation of the business environment,

.Closing the gap between industrialized nations and the Third World, and

.Reversing the breakdown of public and private morality.

As John Sculley notes in his book, Odyssey, "The best way to predict the future is to invent it." The way we address these six critical issues now will determine the quality of life for our children and grandchildren. We can no longer afford to look to the past for answers. Rather, we need to define the future as we would like it to be and then determine how quickly we can get there.

This is especially clear, I think, in the area of education--our focus today. We have, in our hands already, the power to stem the decline in education. Just why is that so important?

In the recent book Workforce 2000: Work and Workers for the 21st Century, commissioned by President Reagan, the authors forecast a huge shortage of both skilled and unskilled labor. While the number of job opportunities will increase, the number of people qualified to fill them will decrease.

As a result, corporations are going to have to recruit more workers from the ranks of the traditionally less skilled-women, minorities, and the poor and underprivileged. That trend, of course, raises a critical question: How do we make these relatively unskilled workers productive? In many cases, companies might even have to teach the basics--reading, writing, and arithmetic--before they can, for example, train someone to run a machine on a factory floor.

Let's take a closer look at the forces shaping the American economy right now--forces that go hand in hand with the future labor shortage and the need for greater productivity.

What's the problem? We're looking at, among other issues:

.A continued integration of the world economy,

.Further shifts in production from goods to services,

.The application of advanced technologies to most industries,

.Faster gains in productivity, and

.Increased competition in product services and labor markets.

These trends are developing at the same time that our labor supply is dwindling, both in number and skill level.

So, while the good news is that the U. S. economy is likely to grow at a healthy pace, the bad news is that work force will grow slowly and that new jobs, even in the service industries, will likely require higher skill levels.

These trends also, I think, point to the need for new government policies. Since we need higher productivity if we hope to be competitive in world markets, the government is going to have to play an active role in supporting the future of education--in making the "KNOWLEDGE NAVIGATOR," which I'll talk about in a minute, a reality.

How do we stimulate world growth? How do we improve the productivity of an aging or unskilled work force? How do we fully integrate minorities and the disadvantaged into the work force?

Training, training, training. And not training as we know it today--but a new kind of training--training that's on demand at the

point of use and that simulates the actual work place and the tasks to be performed.

Now wonder that, right now, education is the second largest service industry in the world. There's a huge market for education and training because of this burgeoning and demand and competitive pressures. Education is also second only to retailing in the numbers of people employed. And, I think, education will be the number-one service industry soon because business is finally realizing that the best way to increase productivity is get workers up to speed faster.

Gone are the days when companies could afford to let a new employee take five years to learn his job. Now, if we can use the computer to stimulate environment, we can train him in one year. And now we can take the employee--the brand new employee, who know nothing about his job, build his competence, and turn him a top performer in a relatively short time.

If we can create the most competent work force, we will have the best competitive advantage--because being competent means being productive. Why is Japan's productivity number one while ours lags so far behind? Just look at the Japanese educational system. The Japanese spend 240 hours a year in the classroom; everybody is motivated to get educated. In the U.S., we spend 180 hours and have 700,000 dropouts each year.

Now, I think the answer to the question "Why is education so important?" is pretty obvious. No one questions the direct link between productivity and education. If we improve the education level, we improve productivity. And that poses a special challenge to educators, both academic and corporate.

Look at the state of training programs in U.S. industry today. According to Anthony Carnevale, chief economist for the American Society for Training and Development, U.S. companies spend $180 billion per year on informal, on-the-job training--and another $130 billion per year on formal training. The entire secondary school system is only spending $140 billion.

Yet, despite the fact that training currently provides the skills for two out of three jobs throughout business and industry, corporate learning has remained a largely unrecognized asset. It certainly has not, until recently, been treated as a major contributor to the achievement of corporate goals and strategies.

In a recent presentation to senior executives at the American Way Conference sponsored by Productivity Incorporated, Xerox CEO David Kearns stated that education and training are the number-one keys to increased productivity. And Kearns pointed out that the average Japanese high school graduate has the equivalent of an American college education.

Add up all these trends and pressures, and what do we have? A crisis--"a point in time when what we are doing is no longer appropriate." We're training people the same way we have for the past 100 years--in instructor-led courses and classrooms. We can put a man on the moon, but we can't change the way we teach our greatest national resource--our children.

We're deluging employees with training, but productivity is declining. If this trend continues, we will be consuming an employee's entire time with training, but still not getting the skills we require, as fast as we require them. Clearly, the solution is to find a way to make training more efficient and effective.

The Future of Training

I think the bridge between where we are today and where we need to be by the year 2000 is found in on-demand, computer-based training. More than a new technology, CBT is a new way of thinking about education itself. We have to take control of learning away from instructional designers and teachers and put it in the hands of the learner so that he can learn at his own pace.

We have to create an environment in which a worker can learn--and then immediately apply that learning to his job. We do not want workers who only learn skills, but rather workers who can apply those skills. In fact, it has been said that wisdom is the right use of knowledge.

CBT has several, perhaps obvious, advantages. For one, it makes learning more engaging. And it makes learning faster--as fast as the employee's ability to learn, working at his own pace, giving him the option of reviewing material as often as possible or moving ahead.

CBT is also more practical in the changing work environment, where employees will have to learn many new jobs in the course of their work life. It is predicted that every person will have to be reeducated seven or eight times over the course of his life. CBT can create a new education paradigm that provides easy access to learning, from the cradle to the grave.

I've already hinted at some of the characteristics of computer-based training--the training of the future. It's training on-demand, at point of use. CBT is learner controlled and directly tied to doing a job better. And, it's interactive and simulates the work environment.

How will we build such a program? With a knowledge base learning model--and I'd like to spend the next few minutes decribing the one that we are building at Arthur Andersen & Co. as the foundation for our future.

The Knowledge Base Learning Model

The Knowledge Base Learning Model defines an approach for the development and delivery of training incorporating elements of data base management, computer-based training, traditional training, and telecommunications to form an integrated information management and training system.

The KBLM supports Arthur Andersen & Co.'s basic goals by enabling us to :

.Train and educate Firm personnel with an interactive, closed-loop system;

.Provide training through a wide variety of vehicles, including paper-based, instructor-led courses; video; CD-ROM, etc.

.Track the competence and skill of individuals in specific areas, while monitoring their training history and progress;

.Assess the effectiveness of training materials;

.Profile the learner to determine how he learns best;

.Provide a means whereby people can diagnose their own skill levels, strengths, and weaknesses;

.Reuse training materials and reduce course development time, as part of a Group Technology approach to course development; and

.Have access to relevant resource materials.

The KBLM includes three major systems:

Delivery system-- which makes information and training materials available to end users and delivers interactive training, refers learners to nonelectronic training, and records data during a training session.

Development system-- which provides the tools for instructional designers and programmers to develop interactive training materials readily.

Management system-- which reports, monitors, and analyzes components of the delivery and development systems.

The major reason that the KBLM meets Arthur Andersen & Co.'s current and future needs is that it incorporates may different information and training delivery vehicles--an ideal approach since no one medium is appropriate for all types of training and since

our use of different technologies will continue to evolve as our choices change.

The KBLM integrates elements of:

.CBT that is developed and delivered on both PCs and mainframes;

.PC, mainframe, and traditional development tools;

.Paper-based training and self-study materials;

.Linear and interactive video; and

.Instructor-led schools.

Once in place, the KBLM will provide significant advantages over our current training and delivery system:

.Reduced training time--Each student's entry-level skills are diagnosed before training. A specific, individualized training plan is developed for each student, based on his learner profile, so that each receives only the training he needs to do the job that he is working on at that time.

.Improved performance--The lag between training and the application of skills on the job is reduced. Training is delivered Just-In-Time--as the student needs it, when he needs it, At the same time, skill levels are assessed before a person begins a job.

.Greater student control--Learners can quickly browse resource materials to locate a specific reference when needed. They control what training they receive and when they receive it. And they can repeat training as often as necessary.

.Better access to information--Users have access to all information resources and job aids from any location. The KBLM employs a free-form approach to information retrieval called Hypermedia, in which text, graphics, video, audio, and interactive training materials are endlessly cross-referenced--concept linked to concept linked to concept.

.Reduced delivery costs--Training is delivered in decentralized locations without instructors. Travel time and expenses are eliminated, while the learner's time can be used more productively.

.Reduced development time--Once the content and design materials are in place, developers can build or revise courses from existing materials.

. Better planning and maintenance of training materials--The KBLM can provide reports to help us manage training resources better. Examples include summaries of the number of times a student uses a course before gaining mastery; summaries of how often each course is used; and summaries that illustrate the relationship between training received and individual performance.

. Better testing--Because the KBLM makes both pretesting and posttesting not only possible but practical, we'll be better able to evaluate what each student already knows before training and what knowledge he's acquired because of training. As a result training more closely resembles a tutorial process. It is effective, and virtually fail-safe.

. Prescriptive Feedback--Each time a student misses a question, a tutorial is given that explains why he answered incorrectly and what the correct answer should be, thereby reinforcing the learning process.

Closed-Loop Training

The Knowledge Base Learning Model is the foundation for a closed-loop approach to training, and now I'd like to describe how that works for both training delivery and development.

As I'm sure you know, Arthur Andersen & Co. sells Audit, Tax, and Management Consulting services. We are a worldwide firm, with an exploding demand for training needs, I'll be talking about our competence in the delivery of our service lines. But the close-loop approach that I'm advocating would also be appropriate for any company that needs training for products or services.

At Arthur Andersen & Co., we have a central Professional Education Division (PED) that develops all the Firm's training programs and courses. At this point, we typically conduct instructor-led classes at our facilities in St. Charles, Illinois.

What will the new CBT environment be like? PED will develop electronic training materials and transmit them to the remote offices via communication lines or distribute them on disks. Before a training session, the system will evaluate the individual's entry skills and learner characteristics and prescribe training targeted to the student's deficiencies.

In the local offices, a manager with a new employee or professional who has just come off a job will ask: "What am I going to do with Sam?" First, he needs to know what Sam can do.

The manager calls up Sam's skills profile on his terminal screen. "He's got white-collar productivity skills. He's got Just-In-Time manufacturing skills. He's got Just-In-Time vendor

skills. Here are some things he doesn't have. He doesn't know how to set up a Group Technology Cell. In these areas, he's untrained." The Firm needs Sam on a job that requires skills he doesn't have.

Sam begins his training. The computer starts asking him questions: "What do you know about this subject?" And it questions Sam, back and forth, to determine his training needs.

The recommended training is then delivered in Sam's office or at home, or at the client site. During the lesson, he can make comments about the material or request help from an instructor/ facilitator.

Let's look at an office learning center. Sam knows what he needs, so he checks out the appropriate training materials and takes them over to a learning cube, where he works with interactive videodiscs played on a touch screen. As he works, he simulates the job environment and gets all his training on the spot.

Perhaps it makes more sense for Sam to train at home or at a client site. When he leaves the office, he can take his training with him.

At the end of each lesson, the system itself measures Sam's acquired skill so we have a basis for the development of an individual competence profile. Because Sam is hooked up by modem to the central training center, information captured during the training (such as item analysis, test scores, student comments, training use data, etc.) is transmitted back to our central training location, where we evaluate it to make decisions about:

.Revisions to existing training programs,

.The need for new or supplemental training programs,

.The frequency of training use, and

.Control prerequisites for future training.

At the same time PED uses the information to maintain a list of certified experts and to develop a skills profile for each individual in each industry, thereby enhancing both the staffing of engagements and the future training for each person.

When Sam goes back to his office and tells his staffing coordinator that he's mastered the subject, the manager can say, "Let me check" and call up the master list of Sam's skills. After the manager sees that Sam is ready, he assigns him to the job, where he might require additional on-site training or a review of the material he's just mastered.

While on the job, Sam's learning curve rises far and fast. And, of course, the story has a happy ending. The client is impressed and pleased. Sam feels good because the client liked the job he did. His manager has a more productive, more well-rounded employee, who's able to get a job done quickly, confidently, and competently.

The New Education Paradigm: Just-In-Time Training

I like to call this type of CBT training Just-In-Time training--professionals with Arthur Andersen & Co. will be able to administer training courses to themselves on an as-needed basis--whenever and wherever necessary, as often as required.

Self-directed, on-demand training has distinct advantages for both the student and the company:

.Individuals can get specific, on-the-job training, as readily accessible as the keyboard of a PC.

.The student can get immediate feedback from the system, retrace his steps as often as necessary to achieve mastery, and take advantage of realistic simulations of the job.

.Training is consistent, paced to the individual's requirements, and directed toward practical, immediate applications.

.Because the student is able to put his new knowledge into practice immediately, his retention rate typically improves by 10 to 25 percent, while training time is cut by as much as 40 percent.

.A company can leverage expertise and knowledge through expert systems, thereby reaching more trainees, more efficiently.

The long-term advantages? Greater competence in the field, resulting in superior client service as well as more efficient and effective training.

Let's, for a minute, explore the other side of Just-In-Time training--course development. At Arthur Andersen & Co. right now, course development at PED is complex and segmented. Communication is linear--information flows in a line from one person to another. Key people are typically in widely separated geographic locations.

This process takes a lot of time; oven worse, it encourages inaccurate communication and increases the likelihood of many revisions or corrections. Every change requires, of course, that the information travel the same route again to produce and cost more--and again. As a result, courses take longer.

At PED , we are proposing that courses be developed in a cell, in which the members of the team (the subject matter expert, the instructional designer, the graphic artist, and the PC/desk top publisher) work together in close physical proximity, communicating virtually instantaneously throughout the process.

The advantages of such a cell are many:

.Each person clearly knows his role and responsibilities.

.Communication is spontaneous and immediate.

.The time and money required to develop a course are radically reduced. In Industry Education, we feel that we can cut course development time from 40 weeks or more to 16 weeks.

.All non-value-added reporting is reduced. Rough drafts of courses reviewed and tested before production.

.Materials are reusable, even when technology changes. Reference works, instructional strategy templates, content, graphics, video and audio segments, and CBT modules are stored in data base libraries. Course designers, using a CD-ROM search engine, can "pull" information from these libraries to speed the development of new materials.

Closed-loop training delivery and development let us get results of programs directly from the office (remember Sam and his modem connection). As course designers, we can see if the material needs some updating. Is our training program doing the job? Do we have too much or too little material on a given subject?

If a new trend emerges that might affect the field, we can change our courses. If we find that students are taking too long to learn a subject, we can modify the way we are delivering the training or the way the learners are taking it.

The New Education Paradigm: The Knowledge Navigator

In the new education paradigm, the focus of learning is performance. The only reason one learns something is to do something. Being able to apply our knowledge means bringing wisdom to our clients and to our jobs.

Now the question is: How do we effect this new way of educating the work force?

We have to believe in its benefits--and while I've discussed these already, the key advantages of CBT bear repeating: We can reduce training time 40 to 60 percent and increase learner retention 25 percent. We can train people more effectively, in

half the time, at significantly lower costs. These advantages are critically important to our goal of enhanced productivity.

The history of CBT has been either great or terrible. And unfortunately, it has been more terrible than great because we've just used the computer as a substitute for self-study books-Hit the enter key and read; hit the enter key and read. CBT has failed because we have not yet used it to simulate the job environment--we haven't yet developed knowledge navigators.

The training concept of the knowledge navigator is that each individual has access to his own personalized knowledge data base. It's tailored to him. It's an idea processor. It gives him the power of many points of view. The system stimulates environments; the learner is more productive. And the result is expanded creativity.

Welcome to a brave new world--a world at the end of a radical change curve. It's a little like jumping off a cliff. There is always trauma associated with change. The reason people fear change is often because of what Alfred E. Neuman said: "Just because everything has changed, doesn't mean anything is any different."

We must recognize that change occurs only after one goes through the valley of despair. If one never comes up the other side, there's no change. So, we need to build uplifting forces to countermand this negative slump.

We at Arthur Andersen & Co. are doing just that--coming up on the other side of change--through a simple approach: do it, try it, fix it.

We have, for example, a manufacturing videodisc that takes users on a tour of a real manufacturing plant. We're working on one that will do that same thing in a bank. We're building all these pieces--all these parts of a new education paradigm--that I've discussed today. And we are already seeing the benefits of on-demand training--benefits such as improved job performance, increased retention, decreased training time, and lower costs.

We agree with the statement made by Thomas Watson, Chairman of IBM: "...the real difference between success and failure in a corporation can very often be traced to the question of how well the organization brings out the great energies and talents of its people..." Computer-based training in a closed-loop system is helping Arthur Andersen & Co. bring out the best in our people.